

**Notice of Allowability**

Application No.

10/092,599

Applicant(s)

SAKITA, RYUUJI

Examiner

Vincent P. Barth

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**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to Amendment dated 9 Jun. 2004.
2. ☒ The allowed claim(s) is/are 1-190.
3. ☒ The drawings filed on 8 Mar. 2002 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☒ All    b) ☐ Some\*    c) ☐ None    of the:
    1. ☒ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

- |   |   |
|---|---|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)           |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                | 6. <input type="checkbox"/> Interview Summary (PTO-413),<br>Paper No./Mail Date _____ |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),<br>Paper No./Mail Date _____ | 7. <input type="checkbox"/> Examiner's Amendment/Comment                              |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit<br>of Biological Material          | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance  |
|   | 9. <input type="checkbox"/> Other _____   |

## **DETAILED ACTION**

### ***Preliminary Comments***

1. Applicant's Amendments dated 9 June 2004 have placed the Application in a condition for allowance as written. Accordingly, the following represents a reasoned statement for allowability.

### ***Allowable Subject Matter***

2. Claims 1-190 are allowable, since the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations set forth therein.

3. Referring to Claim 1, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring method using stereoscopic lattice type moire optics including a light source and a lattice pattern and a camera, moire fringes of a particular order are shifted by a preselected phase while a measurement range of the optics is limited to a vicinity of the particular fringe order, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 2-16 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 17, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring method using stereoscopic lattice type moire optics including a light source, a lattice pattern and a pixel array for detecting the fringes, and a moving mechanism for

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moving the lattice in a direction of the optical axis of the detector, moire fringes of a particular order are shifted by a preselected phase, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 18-24 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 25, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring method using stereoscopic lattice type moire optics including a light source, a stepped lattice pattern and a pixel array for detecting the fringes, and a moving mechanism for moving the lattice in a direction perpendicular to the optical axis of the detector, moire fringes of a particular order are shifted by a preselected phase, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 26-32 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 33, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring method using stereoscopic lattice type moire optics including a light source, a lattice pattern and a color camera for detecting the fringes, and a moving mechanism for moving the lattice back and forth to shift the fringe patterns, moire fringes of a particular order are shifted by a preselected phase, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 34-40 are allowable based on their dependency upon the claim from which each is

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dependent. Referring to Claim 41, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring method using stereoscopic lattice type moire optics including a light source, a lattice pattern and a color camera for detecting the fringes, and a moving mechanism for moving the lattice in a direction perpendicular to the optical axis of the detector, moire fringes of a particular order are shifted by a preselected phase, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 42-48 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 49, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring method using stereoscopic lattice type moire optics including a light source, a lattice pattern which is varied in pitch to thereby shift the moire fringes, a pixel array for detecting the fringes, wherein moire fringes of a particular order are shifted by a preselected phase, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 50-56 and 61 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 57, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring method using stereoscopic lattice type moire optics including a light source, a stepped lattice pattern having at least three surfaces different in height, a light sensitive pixel device arranged in at least three lines for detecting particular lines of the fringes, thereby generating at

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least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 58-60 and 62-64 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 65, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring device using stereoscopic lattice type moire optics including a light source and a lattice pattern and a camera, moire fringes of a particular order are shifted by a preselected phase by a phase shifting mechanism, said camera having a measurement range limited to a vicinity of the particular fringe order, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 66-82 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 83, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring device using stereoscopic lattice type moire optics including a light source and a lattice pattern and a pixel array detector, moire fringes of a particular order are shifted by a preselected phase by a phase shifting mechanism moving back and forth in the direction of the optical axis of the detector, a synchronizing means for synchronizing the scanning time of the detector and the reciprocal movement of the lattice pattern, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 84-94 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 95, the prior art references, either

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considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring device using stereoscopic lattice type moire optics including a light source and a stepped lattice pattern with at least three lattice surfaces different in height and a pixel array camera detector, moire fringes of a particular order are shifted by a preselected phase by a phase shifting mechanism moving back and forth in the direction perpendicular to the optical axis of the detector, a synchronizing means for synchronizing the scanning time of the detector and the reciprocal movement of the lattice pattern, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 96-106 are allowable based on their dependency upon the claim from which each is dependent.

Referring to Claim 107, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring device using stereoscopic lattice type moire optics including a light source and a lattice pattern and a color camera detector, moire fringes of a particular order are shifted by a preselected phase by a phase shifting mechanism moving back and forth in the direction of the optical axis of the detector, a synchronizing means for synchronizing the scanning time of the detector and the reciprocal movement of the lattice pattern, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 108-118 are allowable based on their dependency upon the claim from which each is dependent. Referring to Claim 119, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring device using

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stereoscopic lattice type moire optics including a light source and a stepped lattice pattern with at least three surfaces different in height and a color camera detector, moire fringes of a particular order are shifted by a preselected phase by a phase shifting mechanism moving back and forth in the direction of the optical axis of the detector, a synchronizing means for synchronizing the scanning time of the detector and the reciprocal movement of the lattice pattern, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 120-130 are allowable based on their dependency upon the claim from which each is dependent. Claim 131, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring device using stereoscopic lattice type moire optics including a light source and a lattice pattern with variable pitch for producing fringes and a camera detector, moire fringes of a particular order are shifted by a preselected phase, a synchronizing means for synchronizing a one-line scanning time of the detector and the lattice pitch varying operation of the lattice pattern, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 132-142 are allowable based on their dependency upon the claim from which each is dependent. Claim 143, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring device using stereoscopic lattice type moire optics including a light source and a stepped lattice pattern with at least three surfaces different in height for shifting fringes of a particular fringe order by a preselected phase and a camera detector with

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three or more parallel lines of pixels, moire fringes of a particular order are shifted by a preselected phase, a synchronizing means for synchronizing scanning times of the three lines of the camera, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 144-154 are allowable based on their dependency upon the claim from which each is dependent. Claim 155, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring device using stereoscopic lattice type moire optics including a light source and a lattice pattern for producing fringes and a camera detector with three or more parallel lines of pixels, said lattice pattern being not inclined in a direction in which said pixels are arranged but being inclined in a direction in which said lines are arranged, a synchronizing means for synchronizing scanning times of the three lines of the camera, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 156-166 are allowable based on their dependency upon the claim from which each is dependent. Claim 167, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring device using stereoscopic lattice type moire optics including a light source and a lattice pattern for producing fringes and a camera detector with three or more parallel lines of pixels, said lattice pattern having different pitches each being assigned to a particular visual field, a synchronizing means for synchronizing scanning times of the three lines of the camera, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally



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measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 168-178 are allowable based on their dependency upon the claim from which each is dependent. Claim 179, the prior art references, either considered alone or in combination, do not disclose or render obvious the limitations whereby in a surface configuration measuring device using stereoscopic lattice type moire optics including a light source and a lattice pattern for producing fringes and a camera detector with three or more parallel lines of pixels which are parallel to the lattice pattern, a surface of the workpiece being inclined in a direction in which said lines are being arranged such that each line of pixels picks up a particular portion of the workpiece, a synchronizing means for synchronizing scanning times of the three lines of the camera, thereby generating at least three moire image data shifted in phase, and which are processed to three dimensionally measure the workpiece configuration, in combination with the remaining limitations in the claim. Claims 180-190 are allowable based on their dependency upon the claim from which each is dependent.

#### *Comments*

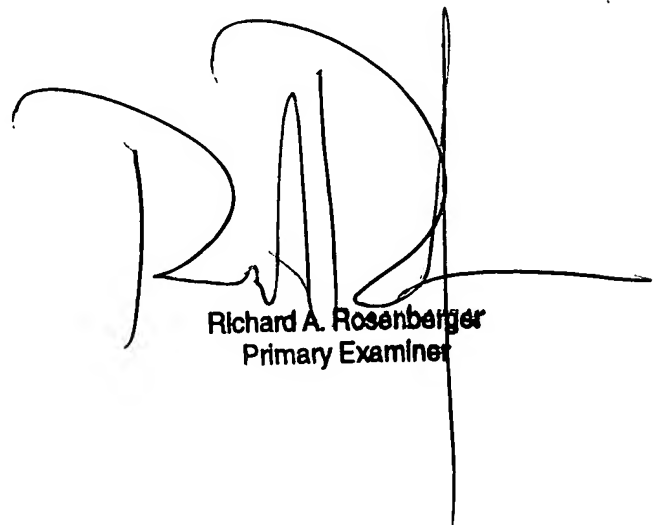
4. Applicant has not provided an Information Disclosure Statement, PTO form 1449, as was requested in the previous Office Action at page 2, paragraph 1. However, in the interest of expediting prosecution, the references cited in the instant Specification from pages 1-5 have been incorporated by the Examiner into a Notice of References cited, form PTO-892, and which has been included herewith. Thus, Applicant should not submit a PTO form 1449, unless new references not previously considered by the Examiner are to be presented.

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5. Claims 1-190 had been rejected in the previous Office Action pursuant to §112 based on the term “stereoscopic lattice”. In the Remarks to the Amendment dated 9 June 2004, Applicant has noted that the term stereoscopic lattice has been defined in the instant Specification at page 3 line 18 to mean a moire system which uses a single lattice, rather than other alternative types of arrangements (see Remarks pg. 44, footnote 2). Claims 6, 13 and 65 had been rejected pursuant to §112 based on the use of the term “measurement range”. In the Remarks to the Amendment dated 9 June 2004, Applicant has noted that the term measurement range has been illustrated in at least Figures 8 and 10 in the instant disclosure (see Remarks pg. 45, first para.). Claims 25, 41, 57, 95, 119 and 143 had been rejected pursuant to §112 based on the use of the term “stepped lattice pattern”. In the Remarks to the Amendment dated 9 June 2004, Applicant has noted that the term stepped lattice pattern has been illustrated in at least Figure 20 in the instant disclosure (see Remarks pg. 45, first full para.). Claims 67-69 and 75-77 had been rejected pursuant to §112 based on the use of the term “distance shifting mechanism”. In the Remarks to the Amendment dated 9 June 2004, Applicant has noted that the term distance shifting mechanism was sufficiently defined within the claim language itself (see Remarks pg. 45, second full para., and footnote 5). Claims 71, 79, 86, 91, 98, 103, 110, 115, 122, 127, 134, 139, 146, 151, 158, 163, 170, 175, 182 and 187 had been rejected pursuant to §112 based on the use of the term “flat” in describing the workpiece surface configuration. In the Remarks to the Amendment dated 9 June 2004, Applicant has noted that the so-called flat workpiece configuration has been illustrated in at least Figure 19 in the instant disclosure and the instant Specification at page 32 (see Remarks pg. 45, last para., and footnote 6). Accordingly, all of the rejections pursuant to Claims 1-190 are withdrawn.

**CONCLUSION**

6. Applicants' Claims 1-190 are allowed based on the reasons set forth above.
7. Any inquiries concerning this communication from the Examiner should be directed to Vincent P. Barth, whose telephone number is 571-272-2410, and who may be ordinarily reached from 9:00 a.m. to 5:30 p.m., Monday through Friday. The official fax number for communications to the group is 703-872-9306.
8. If attempts to reach the Examiner prove unsuccessful, the Examiner's supervisor is Frank G. Font, who may be reached at 571-272-2415.
9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Richard A. Rosenberger  
Primary Examiner